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Kajian Keberintangan Geoelektrik di Tapak Pembuangan Lodak Sungai Jasik, Cameron Highlands untuk Melihat Struktur Subpermukaan dan Potensi Aliran Air Bawah Permukaan (Electrical Resistivity Survey in Sediment Disposal Area Sungai Jasik, Cameron Highlands for Subsurface Structure and Subsurface Water Flow Potential)

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Kajian keberintangan geoelektrik dijalankan di tapak pembuangan lodak yang terletak di antara Ringlet dan Cameron Highlands, Pahang. Terdapat dua litologi yang tersingkap dalam kawasan kajian iaitu batuan asid rejahan (granit) dan batuan metamorf seperti syis, filit, sabak dan terdapat sedikit batu kapur. Objektif kajian ialah untuk menentukan ketebalan lodak yang dibuang di tapak pembuangan, mengenalpasti kawasan yang tinggi kandungan air dan berpotensi untuk air mengalir serta mengesan kedalaman batuan dasar di tapak pembuangan lodak. Tinjauan survei ini dilakukan sebanyak 15 garis survei dengan jarak antara elektrod adalah 5m dan penetrasi sehingga 35m. Panjang garis profil adalah 200 meter dan susun atur yang digunakan adalah Wenner – Schlumberger (Rajah 1). Garis survei dijalankan secara rawak dengan mengikut kecerunan cerun bukit. Data diproses dan dianalisis menggunakan RES2DINV untuk menghasilkan imej keberintangan geoelektrik serta perisian Surfer untuk menghasilkan peta kontur. Imej keberintangan geoelektrik menunjukkan pelbagai nilai keberintangan. Berdasarkan nilai keberintangan, profil subpermukaan kawasan kajian dibahagikan kepada empat jenis; lodak atau tanah tepu air (kurang dari 100 Ωm), tanah baki (100 dan 1,000 Ωm), bongkah batuan granit yang terlulu hawa (1,000 – 2,800 Ωm) dan batuan dasar (lebih dari 2,800 Ωm). Lodak atau tanah tepu air boleh dilihat di kebanyakkan profil subpermukaan. Ketebalannya sekitar 5 m hingga 30 m. Lapisan ini terutamanya terletak di atas lapisan tanah baki atau bercampur dengan tanah baki. Manakala lapisan tanah baki paling dominan di dalam profil subpermukaan. Bagi batuan dasar ditafsirkan berada di pelbagai lokasi dan boleh dilihat pada kedalaman sekitar 10 hingga 20 meter. Berdasarkan topografi pada kawasan kajian, lodak atau tanah tepu air mengalir ke arah tenggara dan utara. Sebagai kesimpulan, lodak atau tanah tepu air yang berada di kebanyakan profil subpermukaan merupakan hasil dari pembuangan lodak dari Tasik Ringlet. Integrasi keberintangan 2-D dan data lubang gerudi menghasilkan hasil kajian yang betul dan boleh dipercayai.

An electrical resistivity imaging (ERI) study was conducted at sediment disposal area located between Ringlet and Cameron Highlands, Pahang. There are two lithologies reported in the study area which are plutonic igneous rock (granite) and metamorphic rock which is made up of schist, phyllite, slate and minor limestone. The objective of this study is to determine the thickness of sediment disposal at dumping area, interpret the location of high water content or saturated zone that has potential for water flow and to detect depth of bedrock in subsurface profile. Resistivity survey consists of 15 lines with 5.0 m spacing for each electrode and their penetration is about 35 m depth. Resistivity survey lines were conducted in length of 200 m and the Wenner – Schlumberger protocol was used for this study (Fig. 1). The survey lines were carried out at random following the slope gradient of study area. The data were processed and analyzed using RES2DINV in order to produce electrical resistivity imaging and Surface software to produce contour map. The results show the variation of resistivity. Based on the resistivity values, the materials within the subsurface profile can be divided into four types; clay or soil with high water content (less than 100 Ωm), residual soil (100 and 1,000 Ωm), highly weathered or fractured rock (1,000 – 2,800 Ωm) and fresh rock or bedrock (more than 2,800 Ωm). The clay or soil with high water content can be captured in almost all subsurface profile. The thickness is around 5 m until 30 m thick. This layer mainly overlies residual soil or mixed together. The most dominant material is residual soil. The bedrock varies based on location. Generally, it could be found around 10.0 to 20.0 m in depth. Based on topography of study area, clay or soil with high water content subsurface might flow to southeast and north of study area. In

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conclusion, clay or soil with high water content that can be showed in almost all subsurface profil were resulted from sedimen disposal Tasik Ringlet. Integration of 2-D resistivity results with boreholes is successful give valid and reliable results.

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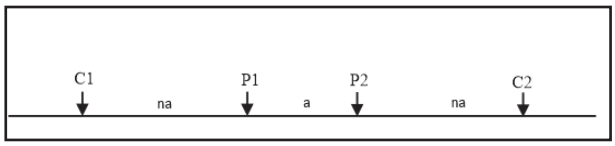

Figure 1: Wenner-Schlumberger array. The distance between electrodes is a, and the Dipole length factor is n, and n = 1 up to 6.

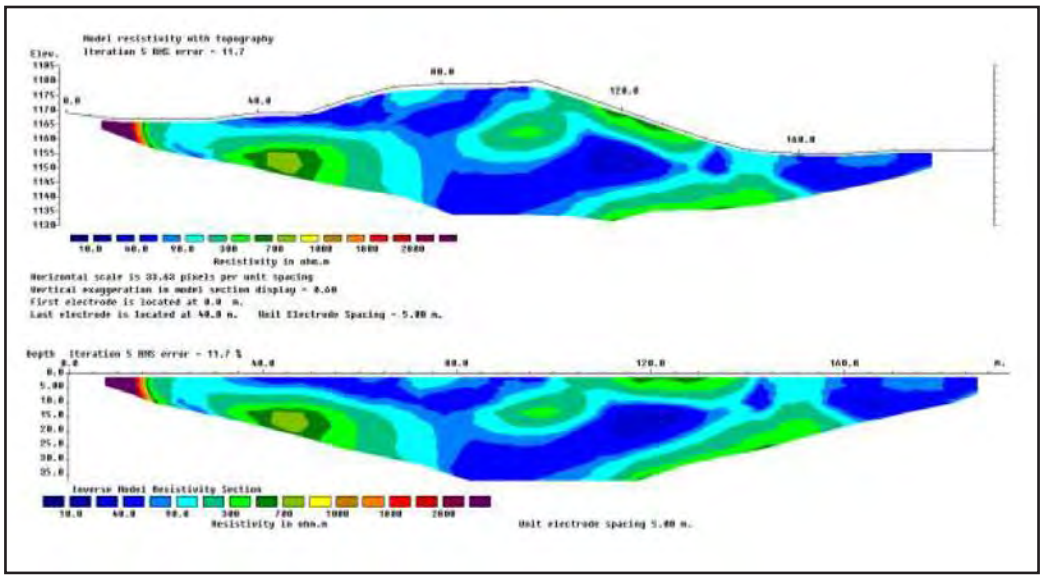

Figure 2: The interpretation model for the subsurface survey line 6.